Remarks

Claims 1, 3-5, 7-11, 13-19, 21, 23-27, and 30-39 are pending. The Applicants have previously canceled claims 2, 6, 12, 20, 22, 28, and 29 without prejudice. Claims 34 – 39 have been added.

The Office action dated May 11, 2006 ["Action"], rejects claims 1, 3, 5, 7-9, 11, 13-16, 18-19, 23-26, and 30-31 as being unpatentable over U.S. Patent No. 6,026,190 to Astle ["Astle"] in view of U.S. Patent No. 5,089,889 to Sugiyama ["Sugiyama"] and in further view of U.S. Patent No. 5,926,209 to Glatt ["Glatt"]. The Action rejects claims 4 and 21 as being unpatentable over Astle, Sugiyama, and Glatt in view of U.S. Patent No. 5,625,714 to Fukuda ["Fukuda"]. The Action rejects claims 10 and 27 as being unpatentable over description of conventional lossy compression techniques at pages 2-3 of the application (which the Examiner terms "admitted prior art") in view of Astle, Sugiyama, and Glatt. The Action rejects claim 17 as being unpatentable over the combination of Astle, Sugiyama, and Glatt in view of U.S. Patent No. 5,969,764 to Sun et al. ["Sun"]. The Action rejects claim 32 as being unpatentable over the combination of Astle , Sugiyama, and Glatt in view of Russ ("The Image Processing Handbook," 2nd ed., CRC Press, 1994, pp. 164-66) ["Russ"]. The Action rejects claim 33 as being unpatentable over the combination of Astle, Sugiyama, and Glatt in view of U.S. Patent No. 6,556,925 to Mori et al. ["Mori"].

For the sake of illustration and without implying limitations on the claims of the instant application, Applicants provide the following comments.

I.   Amendments.
No claims have been amended. No new matter has been added.

II.   Cited Art.
The Applicants make the following observations in the interest of reaching a shared understanding of the disclosures of Sugiyama, Astle, Glatt, Russ, and Mori.

A. Sugiyama.

Sugiyama describes an apparatus for predictive inter-frame encoding. [Sugiyama, Abstract.] The Sugiyama apparatus filters prediction error values prior to the orthogonal

transform, quantization, and encoding processing. [Sugiyama, Fig. 3, 9:23-27.] Specifically, the filter is a "spatial filter whose characteristics are varied in a periodic manner with a period which is an integral number of frame intervals." [Sugiyama, 49:48-50.]

In Sugiyama, only prediction error values for dependent frames are filtered. "Independent frames are not transferred through the spatial filter 3, so that the high frequency components of these frames are available to the decoding apparatus when the dependent frames are recovered by using the prediction error values." [Sugiyama, 10:6-11.] This allows the system of Sugiyama to "substantially entirely remove the high frequency components of the prediction error values of all of the dependent frames by the spatial filter 3, without seriously affecting the resolution of the finally obtained picture...." [Sugiyama, 10:11-15.] However, the filters are designed to only remove some of the high frequency components to avoid "a significant lowering of resolution of the picture obtained" [Sugiyama, 6:57-59.] Therefore, the filter is executed "*in a periodic manner, in units of frame intervals or multiples of frame intervals.*" [Sugiyama, 6:61-63.]

The filters used in Sugiyama are separable one-dimensional filters, including a vertical median filter and a horizontal median filter. [Sugiyama FIG. 4 at 32 and 34.] Each one-dimensional filter "executes **mutually independent** processing in the vertical and horizontal direction of the frame." [Sugiyama 10:43-45, emphasis added.] The output from each one-dimensional median filter is combined with the output of a low-pass filter using a factor α to produce an intermediate output. [*See* Sugiyama, 12:21-31.] The horizontal and vertical outputs are only then combined using a factor β to produce the final output.

B. Astle.

Astle describes a video encoding process which captures a frame of video data, and subsamples it to create a pixel array that is then broken up into (8 x 8) blocks. A "[l]ow pass filter ... is then applied to each (8 x 8) block." [Astle, 5:45-46.] These blocks are then quantized and encoded. Therefore, every block has some portion of the high frequency component filtered out.

The filter in Astle is designed to work in tandem with the quantization of the blocks, and serves to reduce introduction of quantization artifacts in the image. [Astle, 10:46-49.] The rate

controller always considers both the quantization and the filter strength, adjusting each accordingly, to give both a desired bit rate and a desired quality. "At each bit rate a subjective viewing test is performed to determine the particular combination of filter strength and quantizer table that gives the best quality." [Astle 13:29-32.] [*See also, for example,* Astle, 6:27-32; 11:29-66; 12:7-9; 12:18-25; Tables 16, 17, and 18; 13:10-35; 13:58-60.] One option for the filter described in Astle is "a non-linear weighted median filter. For example, one such filter examines the eight pixels surrounding the pixel to be filtered." [Astle, 10:59-60.]

C. Glatt.

Glatt describes using the adjustment of a camera to determine if spatial processing (quantization) or temporal processing (motion vectors) should be emphasized. [*See* Glatt, abstract.] If the camera is stationary, according to Glatt there should be low quantization to preserve picture details. [*See* Glatt, 3:55-65.] Conversely, if the camera is in motion, then "[i]ncreasing the degree of spatial compression (i.e. increasing the spatial quantization) frees bandwidth for temporal compression processing (i.e. the generation of motion vectors) in response to panning." [Glatt, 4:3-6.] The processing is changed depending on whether the camera is moving or still.

Glatt's only mention of compression comes in the course of providing background information on a "conventional video compression unit." [Glatt, 2:66-67.]

> Compression unit 50 is a conventional video compression unit comprising hardware and software which implements a compression algorithm--preferably the well-known MPEG system as described in the MPEG Standard. The MPEG Standard describes a system which effects a degree of compression processing (including spatial and temporal compression). Any compression system where the degree of compression processing can be varied can be used. For example, known systems having compression filters (having predetermined filter length, shape and coefficients) in which the degree of spatial compression is varied by adjusting filter length, adjusting filter coefficients or adjusting filter shape can be used and are considered to be equivalents represented by compression unit 50. *Since the video compression hardware and software are well known to persons of ordinary skill in the art, only the aspects which are germane to this invention will be described.* [Glatt, 2:66-3:15, emphasis added.]

One specific embodiment of compression modification is given, which involves two quantization matrices only—no explicit filters, no kernels, no changing shape of kernels.

The degree to which quantizer 64 effects spatial compression processing of the supplied signal is variable. To that end, quantizer 64 has at least two quantization matrices, each of which causes a different degree of spatial compression processing. Writing a variable into register 65 via input 57 causes one of the quantization matrices to be selected. [Glatt, 3:34-41.]

It is worth noting that Glatt does not mention prediction residuals anywhere within the patent, and thus does not teach or suggest using the filter to filter a prediction residual. Rather, Glatt specifically teaches that spatial compression is equivalent to increasing the spatial quantization – "[i]ncreasing the degree of spatial compression (i.e. increasing the spatial quantization)." [Glatt, 4:3-4] This is reinforced by the preferred embodiment taught in Glatt, where compression is modified depending upon which quantization matrix is selected. [*See* Glatt, 3:36-41.]

It is also worth noting that nowhere in Glatt is filtering used to modify a bitrate.

D.   Russ.

Russ describes various aspects of median filtering for still images. [Russ, 165-166.] Some techniques involve "ranking of the pixels in a neighborhood according to brightness. Then, for example, the median value in this ordered list can be used as the brightness value for the central pixel." [Russ at 165.] Five neighborhood patterns that can be used for median filtering are also described. [*Id.*] The strength of any filter is not discussed, nor is the relative strengths between the filters.

E.   Mori.

Mori describes "determining the expiration of the life of a cutting tool on the basis of a resistance signal from sensor lines." A median filter is used to remove noise from the resistance signal to allow a better measure of the resistance in the cutting tool. [Mori, abstract.]

III.   Claims 1, 3, 5, 7-9, 11, 13-16, 18-19, 23-26, and 30-31.

The Action rejects claims 1, 3, 5, 7-9, 11, 13-16, 18-19, 23-26, and 30-31 as being unpatentable over Astle and Sugiyama in view of Glatt. The Applicants respectfully disagree. For at least the following reasons, independent claims 1, 9, 13, 18, and 24 should be allowable.

As dependent claims of allowable claims, claims 3, 5, 7-8, 11, 14-16, 19, 23, 25-26, and 30-31 should also be allowable. New dependent claims 34-38 should also be allowable.

A. Astle, Sugiyama, and Glatt, taken separately or in combination, fail to teach or suggest at least one limitation of claim 1.

To establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. [MPEP § 2142.] Motivations to combine or modify references must come from the references themselves or be within the body of knowledge in the art. [*See* MPEP § 2143.01.]

Claim 1 recites at least one limitation that Astle, Sugiyama, and Glatt, taken separately or in combination, fail to teach or suggest. For example, claim 1 recites "wherein a kernel defines a neighborhood of values for the median filtering, and wherein the adjusting comprises changing shape of the kernel based at least in part upon the indicator value."

No portion of either Astle or Sugiyama was cited against the quoted language by the Examiner, and the Action indicates that the combination of Astle and Sugiyama does not teach "the feature related to (1) 'changing the kernel of median filtering based upon the indicator value of the buffer' and 'kernel shape.'" [Action, p. 3.] The Applicants agree. The Examiner argues, however, that Glatt teaches "adjusting the degree of compression by adjusting the coefficient, size and shape of a filter" and that:

> [i]t would have been obvious to one of ordinary skill in the art at the time of the invention to apply Glatt's teaching to change the size and shape (size and shape of filter kernel) of Astle's median filter as well as the coefficients of Astle's median filter to modify the compression degree of the system/method taught by the combination of Astle and Sugiyama, because the combination of Astle, Sugiyama, Glatt provides flexibility in bit rate control. [Action, page 4.]

While the passage of Glatt cited by the Examiner, above, discusses "known systems having compression filters (having predetermined filter length, shape and coefficients) in which the degree of spatial compression is varied by adjusting filter length, adjusting filter coefficients

or adjusting filter shape" [Glatt, 3:7-10], it does not otherwise discuss what these known systems

are, or even what is meant by "adjusting filter shape." It specifically *does not* describe median

filters, kernels, or changing the size of the kernel or changing shape of the kernel.

The passage also specifically does not describe using the compression filter to filter a

prediction residual. Glatt's only mention of compression comes in the course of providing

background information on a "conventional video compression unit." [Glatt, 2:66-67.]

> Compression unit 50 is a conventional video compression unit comprising
> hardware and software which implements a compression algorithm--preferably
> the well-known MPEG system as described in the MPEG Standard. The MPEG
> Standard describes a system which effects a degree of compression processing
> (including spatial and temporal compression). Any compression system where the
> degree of compression processing can be varied can be used. For example, known
> systems having compression filters (having predetermined filter length, shape and
> coefficients) in which the degree of spatial compression is varied by adjusting
> filter length, adjusting filter coefficients or adjusting filter shape can be used and
> are considered to be equivalents represented by compression unit 50. *Since the*
> *video compression hardware and software are well known to persons of ordinary*
> *skill in the art, only the aspects which are germane to this invention will be*
> *described.* [Glatt, 2:66-3:15, emphasis added.]

One specific embodiment of compression modification is given, which involves two

quantization matrices only—no explicit filters, no kernels, no changing shape of kernels.

> The degree to which quantizer 64 effects spatial compression processing of the supplied
> signal is variable. To that end, quantizer 64 has at least two quantization matrices, each
> of which causes a different degree of spatial compression processing. Writing a variable
> into register 65 via input 57 causes one of the quantization matrices to be selected.
> [Glatt, 3:34-41.]

Without even a mention of median filters or kernels, one of ordinary skill in the art could

not be expected to surmise the claimed arrangement of "wherein a kernel defines a

neighborhood of values for the median filtering, and wherein the adjusting comprises changing

shape of the kernel based at least in part upon the indicator value" from the mere mention of

"adjusting filter shape" in Glatt.

Finally, Glatt describes changing processing depending on whether a camera is moving

or still. Even if, for the sake of argument, this included adjusting filtering, it still would not

involve adjusting filtering based on an indicator associated with a level of a buffer. Glatt does

not teach or suggest, and in fact leads away from, "wherein the adjusting comprises changing shape of the kernel *based at least in part upon the indicator value*," as recited in claim 1.

Since the cited references fail to describe at least one element recited in claim 1, Applicants request the rejection of claim 1 be withdrawn.

Thus, claims 1 and its dependent claims, 3, 5, 7, 8, 30 and 31, for at least this reason, are allowable over the cited art.

B.   The combination of Sugiyama and Astle to reject claims 1, 3, 5, 7-9, 11, 13-16, 18-19, 23-26, and 30-31 is improper.

The combination of Sugiyama and Astle proposed by the Examiner to reject claims 1, 3, 5, 7-9, 11, 13-16, 18-19, 23-26, and 30-31 is improper. As to Astle, the Examiner states that "it is not clear that, in an inter-frame coding mode, the digitized video image signal of 301 of Fig. 3 is a current frame or a prediction residual frame." [Action, p. 3.] The Applicants agree to the extent that filtering a prediction residual is not shown in Astle. The Examiner argues, however, that Sugiyama teaches "inter-frame predictive encoding system and method for controlling data rate" features and that:

> [i]t would have been obvious to one of ordinary skill in the art at the time
> of the invention to apply Sugiyama's teaching to filtering a prediction
> error signal in Astle's system because the combination minimizes
> degradation of decoded inter-coded frames. [Action, page 4.]

Applicants respectfully disagree. Even if, for the sake of argument, Astle *could be* modified as suggested by the Examiner, this is not enough to make the Examiner's proposed modification obvious. [MPEP 2143.01; *see also* MPEP 2142.01 and 2145.X.C and D.] In fact, due to the nature of the filtering in Sugiyama, in that the independent frames are not filtered while prediction error values of "dependent" frames are, the Examiner's proposed modification *changes the principle of operation* of Astle and is thus improper. [*See In re Ratti*, 270 F.2d 810, MPEP § 2143.01.] In addition, Sugiyama and Astle teach away from the combination suggested by the Examiner.

Astle is directed toward matching a quantization level with a filter strength S to produce the best quality image at a desired bitrate. It is not directed toward treating predicted frames differently than independent frames in filtering. It does discuss filtering for *all* frames, with the filter strength matching the quantization. Sugiyama, by contrast, describes selectively filtering

prediction error values for dependent frames while not filtering independent frames to preserve the high frequency components in the unfiltered independent frames. Furthermore, Sugiyama describes leaving some prediction error values for dependent frames unfiltered to preserve the high frequency components in the eventual output.

Astle's failure to address filtering of prediction error signals further suggests, if nothing else, treating filtering for all frames similarly. Because of this, Astle teaches away from treating prediction error residuals differently than independent frames, as in the Examiner's proposed modification with Sugiyama. Furthermore, as Astle describes filtering in the same manner for all frames, the Examiner's proposed modification would change this principle of operation of Astle.

In addition, the motivation the Examiner cites to modify Astle with Sugiyama is improper. The Examiner writes as the motivation to modify Astle with the teachings of Sugiyama that "it is desirable to control bit rate of a prediction error signal without significantly reducing the resolution of an image as pointed out by Sugiyama." However, the modification suggested by the Examiner would produce the opposite result, a reduced resolution of the image in Astle. Astle increases a filter strength S as it decreases a quantization rate to improve overall quality and decrease quantization artifacts. [Astle, 11:56-59.] A specific strength of filter is used for a given quantization rate to produce the best quality image. [*See* Astle, tables 16-18 and the associated text.] In Astle, the rate controller controls both the strength S of the filter and the quantization level to produce the highest overall subjective quality image with a given bitrate. [*See* description of Astle, at II-B, above.] Assuming that Astle could be modified as suggested by the Examiner, simply adding an extra stage of filtering would further reduce resolution of prediction residuals and thereby increase lossy compression.

For at least these reasons, claims 1, 9, 13, 18, and 24 should be allowable. As dependent claims of allowable claims, claims 3, 5, 7-8, 11, 14-16, 19, 21, 23, 25-26, and 30-31 should also be allowable.

C.   The combination of Sugiyama, Astle, and Glatt to reject claims 1, 3, 5, 7-9, 11, 13-16, 18-19, 23-26, and 30-31 is improper.

As noted above, the combination of Astle and Sugiyama is improper. For at least this reasons, the combination of Astle, Sugiyama, and Glatt is improper.

For several other reasons, the combination of Sugiyama, Astle and Glatt proposed by the Examiner to reject claims 1, 3, 5, 7-9, 11, 13-16, 18-19, 23-26, and 30-31 is improper. The

Examiner states that Astle and Sugiyama do not "teach explicitly the feature related to (1) 'changing the kernel of median filtering based upon the indicator value of the buffer' and (2) 'kernel shape.'" Applicants agree. The Examiner argues, however, that Glatt teaches "adjusting the degree of compression by adjusting the coefficient, size and shape of a filter," and that:

> [i]t would have been obvious to one of ordinary skill in the art at the time of the invention to apply Glatt's teaching to change size and shape (size and shape of filter kernel) of Astle's median filter as well as the coefficients of Astle's median filter to modify the compression degree of the system/method taught by the combination of Astle and Sugiyama, because the combination of Astle, Sugiyama, Glatt provides flexibility in bit rate control. [Action, page 4.]

Applicants respectfully disagree. Even if, for the sake of argument, Astle *could be* modified as suggested by the Examiner, this is not enough to make the Examiner's proposed modification obvious. [MPEP 2143.01; *see also* MPEP 2142.01 and 2145.X.C and D.] In fact, due to the nature of the filtering in Astle, which uses a smoothly adjustable filter strength, the Examiner's proposed modification *changes the principle of operation* of Astle and is thus improper. [*See In re Ratti*, 270 F.2d 810, MPEP § 2143.01.]

The filter in Astle has a strength S that changes depending on the quantization table used and the bit rate desired. The strength S of the filter along with the quantization level determines quality of image. "At each bit rate a subjective viewing test is performed to determine the particular combination of filter strength and quantizer table that gives the best quality." [Astle 13:29-32.] In Astle, the rate controller controls both the strength S of the filter and the quantization level to produce the highest overall subjective quality image with a given bitrate. [See description of Astle, at II-B, above.] Thus, Astle does not indicate that a desire for flexibility in bit rate control would motivate changing shape of kernel. Inasmuch as Glatt describes changing processing depending on whether a camera is moving or still, Glatt also does not indicate that flexibility in bit rate control would motivate changing shape of kernel.

The filters in Astle have a strength that can be modified linearly. [*See* Astle, table 18.] Changing shape of a kernel (as in the Examiner's proposed combination) provides no such linear modification, and thus offers less flexibility than the filter taught in Astle. As such, not only is there no motivation to combine Astle with Glatt, but Astle actively teaches away from such a combination.

Moreover, Astle teaches away from changing shape of a kernel as in the Examiner's proposed combination. For example, filters in Astle are described as having a strength—the filter tap ratio, which can be decreased and increased. [Astle 12:18 to 13:20.] The strength of the filter along with a quantization table for each bit rate "may produce a curve," which is then "averaged for several sequences then entered into a table…" [Astle 13, 30-35.] Thus, Astle describes a filter with a single shape, which, by adjusting various qualities of the single filter, can have its strength changed. Astle teaches away from changing shape of a kernel to adjust strength.

The combination of Sugiyama and Glatt is improper for many of the same reasons that the combination of Astle and Glatt is improper. For example, Sugiyama describes using factors α and β to regulate results of filtering. Adjusting kernel shape (as in the Examiner's proposed modification) *changes the principle of operation* of Astle and is thus improper. Like Astle, Sugiyama does not indicate that a desire for flexibility in bitrate control would motivate changing shape of kernel. Inasmuch as Glatt describes changing processing depending on whether a camera is moving or still, Glatt also does indicate that flexibility in bit rate control would motivate changing shape of kernel.

Furthermore, Glatt does not mention prediction residuals, only describing filtering of video generally. Sugiyama describes filtering only the prediction residuals of dependent frames, which is done to "substantially entirely remove the high frequency components of the prediction error values of all of the dependent frames by the spatial filter 3, *without seriously affecting the resolution of the finally obtained picture…*" [Sugiyama, 10:11-15.]   Thus, further, there is no reason to combine in either Sugiyama or Glatt to combine the two references. Sugiyama requires filtering only prediction error values of dependent frames (and, at times, only prediction error values for some but not all dependent frames), so as to preserve high frequency components. Glatt describes filtering video in a way not limited to prediction error values, which, if used in Sugiyama, would remove or degrade high frequency components in independent frames, "seriously affecting the resolution of the finally obtained picture" in Sugiyama. [*See* Sugiyama, 10:14-15.] Therefore, combining Glatt with Sugiyama as in the Examiner's proposed combination not only changes the principle of operation of Sugiyama, but tends to make the Sugiyama system unsuitable for its intended purpose, resulting in pictures with worse resolution.

Moreover, if the proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. [*See* MPEP 2143.01.V, *In re Gordon*, 733 F.2d 900], Glatt's filtering of video generally, which would remove or degrade high frequency components in independent frames, leads away from Sugiyama's filtering of just prediction error values of dependent frames so as to preserve at least a portion of the high frequency components.

For at least these reasons, claims 1, 9, 13, 18, and 24 should be allowable. As dependent claims of allowable claims, claims 3, 5, 7-8, 11, 14-16, 19, 23, 25-26, and 30-31 should also be allowable.

IV.   Claims 4 and 21.

The Action rejects claims 4 and 21 as being unpatentable over Astle, Sugiyama and Glatt in view of Fukuda. The Applicants respectfully disagree. As noted in section III, the combination of Astle and Sugiyama is improper, and the combination of Astle, Sugiyama and Glatt is improper. For at least these reasons, the combination of Astle, Sugiyama, Glatt and Fukuda is improper. Claims 4 and 21 should be allowable.

V.   Claims 10 and 27.

The Action rejects claims 10 and 27 as being unpatentable over Astle, Sugiyama and Glatt in view of description of conventional lossy compression techniques at pages 2-3 of the application (which the Examiner terms "admitted prior art"). The Applicants respectfully disagree. As noted in section III, the combination of Astle and Sugiyama is improper, and the combination of Astle, Sugiyama and Glatt is improper. For at least these reasons, the combination proposed by the Examiner to reject claims 10 and 27 is improper. Claims 10 and 27 should be allowable.

VI.   Claim 17.

The Action rejects claim 17 as being unpatentable over Astle, Sugiyama and Glatt in view of Sun. The Applicants respectfully disagree. As noted in section III, the combination of Astle and Sugiyama is improper, and the combination of Astle, Sugiyama and Glatt is improper.

For at least these reasons, the combination of Astle, Sugiyama, Glatt and Sun is improper. Claim 17 should be allowable.

VII.   Claim 32.

The Action rejects claim 17 as being unpatentable over Astle, Sugiyama and Glatt in view of Russ. The Applicants respectfully disagree. As noted in section III, the combination of Astle and Sugiyama is improper, and the combination of Astle, Sugiyama and Glatt is improper. For at least these reasons, the combination of Astle, Sugiyama, Glatt and Russ is improper.

In addition, the combination of Astle, Sugiyama, Glatt and Russ is improper for the following reasons. The Action indicates that the combination of Astle, Sugiyama, and Glatt do not teach "explicitly the feature related to the sorting and selecting steps recited in Claim 32." [Action, p. 8.] The Applicants agree. The Examiner further argues that Russ teaches "adjusting the degree of compression by adjusting the coefficient, size, and shape of a filter" and that:

> [i]t would have been obvious to one of ordinary skill in the art at the time
> of the invention to apply the combined Russ' teaching in the method
> taught by Astle, Sugiyama, and Glatt because the overall combination
> provides flexibility in bit rate control. [Action, page 94.]

Applicants respectfully disagree. Even if, for the sake of argument, the combined system of Astle, Sugiyama, and Glatt *could be* modified as suggested by the Examiner, this is not enough to make the Examiner's proposed modification obvious. [MPEP 2143.01; *see also* MPEP 2142.01 and 2145.X.C and D.] In fact, even if, assuming for the sake of argument, Russ describes "sorting" and "selecting" as in the Examiner's proposed combination, due to the nature of the filtering in Astle, which uses a smoothly adjustable filter strength, and the type of filtering in Sugiyama, where only prediction error values for dependent frames are filtered, the Examiner's proposed modification *changes the principle of operation* of both Astle and Sugiyama and is thus improper. [*See In re Ratti*, 270 F.2d 810, MPEP § 2143.01.]

1.   The combination of Russ and Astle is improper.

In Russ, various kernel sizes and shapes are given. The strength of these kernels is not clear in Russ, nor is the relationship between a given kernel and another kernel. As described above, at III C., Astle describes a filter with a single shape, which, by adjusting various qualities of the single filter, can have its strength changed. Nothing in Astle involves filters with different shapes. Astle teaches away from changing shape of a kernel to adjust strength.

2. The combination of Russ and Sugiyama is improper.

As described above, various kernel sizes and shapes are given in Russ. The strength of these kernels is not clear in Russ, nor is the relationship between a given kernel and another kernel. Sugiyama describes using a specific type of filters that "serve to eliminate prediction error values which correspond to isolated very small regions or to thin lines in the spatial domain." [Sugiyama 12:3-5.]

Even if, for the sake of argument, Sugiyama *could be* modified as suggested by the Examiner, this is not enough to make the Examiner's proposed modification obvious. [MPEP 2143.01; *see also* MPEP 2142.01 and 2145.X.C and D.] In fact, the Examiner's proposed modification *changes the principle of operation* of Sugiyama and is thus improper. [*See In re Ratti*, 270 F.2d 810, MPEP § 2143.01.] In addition, Sugiyama and Russ teach away from the combination suggested by the Examiner.

A discrete and mutually independent horizontal and vertical filter in Sugiyama "executes mutually independent processing in the vertical and horizontal direction of the frame." [Sugiyama 10:43-45.] The separable horizontal and vertical median filters in Sugiyama are one-dimensional. These filters are not designed to work in an isolated fashion. Rather, filter results are first multiplied by a weighing factor and are then combined with the results of a separate low-pass filter, which is also weighted. [Sugiyama, 12:21-31.]

The filters of Russ used in the Examiner's proposed combination are neither separable nor one-dimensional (as in Sugiyama). Thus, combining Russ with Sugiyama would, at a minimum, change the principle of operation of Sugiyama, and is therefore improper.

As the combination used in the rejection of claim 32 is improper, Applicants respectfully submit that claim 32 is in condition for allowance.

VIII. Claim 33.

The Action rejects claim 17 as being unpatentable over Astle, Sugiyama and Glatt in view of Mori. The Applicants respectfully disagree. As noted in section III, the combination of Astle and Sugiyama is improper, and the combination of Astle, Sugiyama and Glatt is improper. For at least these reasons, the combination of Astle, Sugiyama, Glatt and Mori is improper.

In addition, the combination of Astle, Sugiyama, Glatt and Russ is improper for the following reasons. The combination of Astle, Sugiyama, and Glatt in view Mori used to reject

claim 33 is improper because Mori is not analogous prior art and thus cannot properly be used to

reject the current application. The rules to determine proper analogous art are quoted below.

> The examiner must determine what is "analogous prior art" for the purpose of
> analyzing the obviousness of the subject matter at issue. "In order to rely on a reference
> as a basis for rejection of an applicant's invention, the reference must either be in the field
> of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem
> with which the inventor was concerned." In re Oetiker, 977 F.2d 1443, 1446, 24 USPQ2d
> 1443, 1445 (Fed. Cir. 1992). See also In re Deminski, 796 F.2d 436, 230 USPQ 313 (Fed.
> Cir. 1986); In re Clay, 966 F.2d 656, 659, 23 USPQ2d 1058, 1060-61 (Fed. Cir. 1992)
> ("A reference is reasonably pertinent if, even though it may be in a different field from
> that of the inventor's endeavor, it is one which, because of the matter with which it deals,
> logically would have commended itself to an inventor's attention in considering his
> problem."); Wang Laboratories Inc. v. Toshiba Corp., 993 F.2d 858, 26 USPQ2d 1767
> (Fed. Cir. 1993); and State Contracting & Eng'g Corp. v. Condotte America, Inc., 346
> F.3d 1057, 1069, 68 USPQ2d 1481, 1490 (Fed. Cir. 2003) (where the general scope of a
> reference is outside the pertinent field of endeavor, the reference may be considered
> analogous art if subject matter disclosed therein is relevant to the particular problem with
> which the inventor is involved). MPEP 2141.01 (A)(1)

> A reference is reasonably pertinent if . . . it is one which, because of the matter
> with which it deals, logically would have commended itself to an inventor's attention in
> considering his problem. Thus, the purposes of both the invention and the prior art are
> important in determining whether the reference is reasonably pertinent to the problem the
> invention attempts to solve. In re Clay, 966 F.2d at 659.

Mori is geared toward "determining the expiration of the life of a cutting tool on the basis

of a resistance signal from the sensor lines." [Mori, Abstract.] The resistance signal is sampled,

and then the sampled data is run through a median filter to eliminate noise. Mori is not

analogous art as it has nothing to do with video, let alone having anything to do with video

compression, filtering video, or filtering video for bitrate control. Mori is not a "reasonably

pertinent" reference. It would not have logically "commended itself" to Applicants' attention.

The median filter itself in Mori is used to eliminate noise from a resistance signal, which looks

nothing like video information or prediction residuals. Therefore, there is no reason to suppose

that the median filtering performed in Mori on a completely different sort of signal (a resistance

signal) for a completely different purpose (to determine whether a cutting tool has expired) is

"reasonably pertinent." Mori is not analogous prior art.

The Mori reference is not a valid prior art reference to cite against the claims of the present application. For at least this reason, Applicants submit that claim 33, whose rejection relied on Mori, is in condition for allowance.
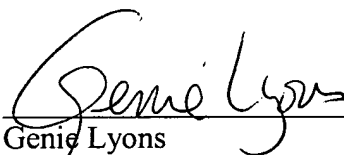
IX. New Claims 34 - 390

There is support for new claims 34 - 39 in the specification at, for example, page 18, line 5 through page 19, line 2. New claims 34 - 39 should be allowable. Such action is respectfully requested.

CONCLUSION

Claims 1, 3-5, 7-11, 13-19, 21, 23-27, and 30-39 should be allowable. Such action is respectfully requested.

Respectfully submitted,

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